



# AIR FORCE OFFICE OF SCIENTIFIC RESEARCH (AFOSR) PRINCIPAL INVESTIGATOR WINS WOLF FOUNDATION PRIZE

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## Payoff

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Dr. Joseph Keller's original research on high-frequency electromagnetic scattering formed the basis for the design of stealth platforms such as the F-117. This research and his current research on electromagnetic wave propagation through turbulent air enhances the reputation of AFOSR's funded research program.

## Accomplishment

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Dr. Joseph Keller, an Air Force Office of Scientific Research (AFOSR) principal investigator, shared the Wolf Foundation's 1996-1997 prize in mathematics. The Foundation recognized Dr. Keller for his innovative contributions to electromagnetic, optical and acoustic wave propagation and to fluid, solid, quantum and statistical mechanics.

## Background

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The Wolf Foundation was established in 1976 by Dr. Ricardo Wolf, an inventor, diplomat and philanthropist to promote science and art. Scientific prizes are awarded annually in the fields of agriculture, chemistry, mathematics, medicine and physics. The prize carries a \$100,000 stipend for each recipient. Dr. Keller concentrates his AFOSR-funded research on wave propagation. In fact, the design of the stealth platforms - particularly the F-117 - is based on his original research on high-frequency electromagnetic scattering. His current research is focused on electromagnetic wave propagation through turbulent and random media. Turbulence causes local changes in the refractive index of air. Laser wavefronts transmitted through turbulent air become distorted and can be diverted or break up into several beams. Understanding how electromagnetic waves propagate through random media may enable the Air Force to identify and acquire targets that are obscured by randomly varying media such as tree foliage. Dr. Keller holds a joint appointment in mathematics and mechanical engineering at Stanford University and is a member of the United States National Academy of Sciences. His other honors include the National Medal of Science which he received during White House ceremonies in 1988.